CLAIMS

What is claimed is:

1. A rotary cutting tool and associated set of cutting inserts, which in combination eliminate overlap marks from a work piece which has been machined by the rotary cutting tool and the associated set of cutting inserts, comprising:

a rotary cutting tool including a body having a rotational axis, and a plurality of pockets each fabricated to a predetermined dimensional tolerance, wherein each pocket is configured to receive at least one cutting insert; and

a plurality of cutting inserts each one of which is configured and dimensioned to be received within and secured to the pocket, wherein

at least two of the pockets are arranged such that the insert installed in one of the at least two of the pockets generates overlapping cutting contact made with a work piece relative to cutting contact made with the work piece by a second insert installed in one of the at least two of the pockets when the rotary cutting tool is rotated and brought to bear laterally against the work piece,

each cutting insert has a first end, a second end, at least one cutting edge spanning the first end and the second end, a first corner formed at the juncture of the cutting edge and the first end, and a second corner formed at the juncture of the cutting edge and the second end, wherein the cutting edge has a first tapered section, and a second tapered section extending from the first corner part way to the second corner, and

the taper of the first tapered section and the second tapered section of every insert is of a magnitude and a configuration which assures that depth of cutting of the work piece performed by any one of the first tapered section and the second tapered section will never exceed the predetermined dimensional tolerance in magnitude when the rotary cutting tool is rotated and brought to bear laterally against the work piece,

whereby overlapping cutting contact of the inserts made with the work piece and taper of the inserts combine to eliminate both inwardly projecting lap marks and outwardly projecting lap marks which could otherwise be formed in the course of machining the work piece.

2. The rotary cutting tool and associated set of cutting inserts according to claim 1, wherein a radial runout dimension is established for each insert due to manufacturing tolerances; the taper of the first tapered section and the second tapered section of every insert establish the radial runout compensation dimension; and the radial runout compensation dimension is of greater magnitude than that of the manufacturing tolerance, whereby maximum outward radial displacement of any portion of the cutting edge of each insert from the rotational axis of the rotary cutting tool is less than the magnitude of the predetermined manufacturing tolerance.

3. The rotary cutting tool and associated set of cutting inserts according to claim 1, wherein the pockets are arranged such that cutting contact made with the work piece by one insert overlaps cutting contact made with the work piece by a subsequently passing insert by more than half of the length of the cutting edge of at least one of the insert and the subsequently passing insert.

4. The rotary cutting tool and associated set of cutting inserts according to claim 1, wherein cutting contact with a work piece of one insert intersects cutting contact with the work piece by a subsequently passing insert at the intersection of a first tapered section of the insert with a second tapered section of the subsequently passing insert when the rotary cutting tool is rotated and brought to bear laterally against the work piece.

5. The rotary cutting tool and associated set of cutting inserts according to claim 1, wherein tapered configuration of the first tapered section and of the second section of each insert comprises a convex curved configuration.

6. The rotary cutting tool and associated set of cutting inserts according to claim 5, wherein the convex curved configuration is that of a constant radius curve.

7. The rotary cutting tool and associated set of cutting inserts according to claim 1, wherein the pockets are arranged to seat a plurality of series of axially and circumferentially displaced, generally parallel installed inserts, wherein adjacent

axially and circumferentially displaced inserts of each series overlap one another slightly along their respective lengths.

8. The rotary cutting tool and associated set of cutting inserts according to claim 1, wherein the body of each insert is substantially a parallelepiped when viewed in side elevation.

9. The rotary cutting tool and associated set of cutting inserts according to claim 1, wherein the pockets are helically arrayed along the length of the body.

10. The rotary cutting tool and associated set of cutting inserts according to claim 1, wherein the body of the rotary cutting tool includes a plurality of helical flutes, wherein the pockets are disposed within the helical flutes.

11. A method of arranging a rotary cutting tool and associated set of cutting inserts to eliminate overlap marks in machined work pieces, comprising the steps of:

providing a rotary cutting tool having pockets each disposed to receive at least one insert;

arraying the pockets in overlapping fashion such that an insert installed in one of the pockets generates overlapping cutting contact made with a work piece relative to cutting contact made with the work piece by a subsequently passing insert when the rotary cutting tool is rotated and brought to bear laterally against the work piece;

limiting a runout tolerance dimension of each the pocket to a predetermined magnitude exceeding that of manufacturing tolerance of the pocket;

configuring each insert to have a tapered lateral cutting edge such that no part of the insert projects radially outwardly from the rotary cutting tool when the insert is installed in a pocket by a dimension of magnitude greater than that of the runout tolerance of each pocket.

12. The method according to claim 11, comprising the further step of rotating the rotary cutting tool and bringing the rotary cutting tool to bear laterally

against a work piece until each cut made by a the insert has been subjected to a subsequent overlapping cut made by another insert.

13. The method according to claim 11, comprising the further step of forming at least two helical flutes in the rotary cutting tool and locating the pockets along each one of the at least two helical flutes.

14. The method according to claim 13, comprising the further step of locating at least some of the pockets along any one of the helical flutes such that the end of one pocket overlaps the end of an adjacent pocket.

15. The method according to claim 11, comprising the further step of locating at least some of the pockets such that at least one pocket slightly overlaps an adjacent, axially displaced pocket.

16. The method according to claim 11, comprising the further step of locating at least some subsequently passing pockets which are non-adjacent to one another such that each pocket is overlapped by at least half the length of an insert by a subsequently passing pocket.